

PROJECT NAME

DESIGN, SUPPLY, INSTALLATION AND COMMISSIONING OF
132/33/11kV GRID SUBSTATIONS ON TURNKEY BASIS
against Lot-1 of Package-C1 under ADB Loan No.3087-BAN
Contract No.: DESCO/CS/PSEELIP Tranche-2
(Lot-1 of Package-C1)/Tender-4(27)/370/2016/116

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CLIENT NAME



CONTRACTOR NAME



SUB-CONTRACTOR NAME

SIEMENS

SUB-CONTRACTOR DRAWING NUMBER

DRAWING / DOCUMENT TITLE

COMMON
33kV CGIS Technical Specification

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TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
36 kV GAS INSULATED SWITCHGEAR AND CONTROL EQUIPMENT

SI No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
INCOMING AND OUTGOING SWITCH GEAR UNITS:				
1	Manufacturer's Name & Address		To be mentioned	SIEMENS AG/ Germany
1.1	Manufacturer's Model & Type		To be mentioned	8DB
2	Applied standard		To be mentioned	IEC 62271-1 IEC 62271-200
3	Rated nominal voltage	kV	33	33
4	Rated Voltage	kV	36	36
5	Rated current for main and reserve bus each	A	2500	2500
6	Rated short time current	kA	40	40
7	Short time current rated duration	Sec.	3	3
7.1	Enclosure Materials		Al. Alloy	Aluminium alloy AlSi10Mg
8	Circuit Breaker:			
	Type		VCB	VACUUM
	Rated Voltage	kV	36	36
	Rated Current	A	2500 for incoming 1250 for outgoing	2500 for incoming 1250 for outgoing
	Operating Cycle	No.	To be mentioned	10000
	Rated short Ckt. breaking current	kA	40	40
	Rated short Ckt. making current	kA	100	100
	Rated breaking time	Cycle	3	<85msec
	Opening time	mili Sec	To be mentioned	<70msec
	Closing time	mili Sec	To be mentioned	<95msec
	Rated operating sequence		0-0.3sec-CO-3min-CO	O-0,3s-CO-3min-CO
	Control voltage	V	DC 110	DC 110
	Motor voltage for spring charge	V	AC 240	230V±10%.
	Trip coils for each circuit breaker	Nos.	2	2
9	Three Position Disconnect Switch:			
	Type		To be mentioned	SIEMENS
	Rated Voltage	kV	36	36
	Rated current	A	2000	2500A for Incoming; 1250A for Outgoing.
	Switch positions		Closed, Open, Earth	Closed, Open, Earth
	Electrical and Mechanical interlock		As per IEC 62271-200	YES
10	Current Transformer:			

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
	Rated Voltage	kV	36	Low voltage CT outside high voltage circuit
	Accuracy class, Metering		0.2	0.2
	Accuracy class, O/C& E/F Protection		5P15	5P15
	Accuracy class, Differential Protection		X	X
	Rated Current Ratio for Incoming Switchgear	A	2000-1000/1-1-1	2000-1000/1-1-1
	Rated Current ratio for Outgoing Switchgear	A	1200-600/1-1-1A	1200-600/1-1-1
	Burden	VA	15	15
11	Rated Frequency	Hz	50	50
12	Insulation level:			
	AC withstand voltage 1 min. dry	kV	70	70
	Impulse withstand, full wave	kV	170	170
13	Degree of Protection:			
	Enclosure		IP4X	IP31D
	HV Compartment		IP65	IP65
	LV Compartment		IP40	IP41
14	SF6 Safety and Life:			
	SF6 Pressure:			
	Rated pressure at 20°C		To be mentioned	70kPa
	Minimum functional pressure at 20°C		To be mentioned	50kPa
	Bursting Pressure		To be mentioned	Pickup pressure for bursting protection >300 kPa Bursting pressure of the enclosure > 600 kPa
	Gas Leakage Rate		To be mentioned	<0.1% p.a. (referred to the absolute gas pressure)
	Safety Indication:			Gas pressure indicators (manometers)
	Capacitive Voltage Indicator (EU/Japan/USA origin)		For 3 phases in the front or rear side of the panel	LRM per phase at the front side (EU origin)
	Gas pressure Manometer		As per IEC 62271-1	IEC 62271-1 IEC 62271-200

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
	Bus Bar Gas pressure Manometer		As per IEC 62271-1	IEC 62271-1 IEC 62271-200
	Life / Endurance of Switchgear:			
	Circuit Breakers		As per IEC 62271-100	IEC 62271-1 IEC 62271-200
	Disconnectors and Earthing Switches		As per IEC 62271-102	IEC 62271-1 IEC 62271-200
15	Bus Bar and Accessories:			
	Bus Bar:			
	Bus bar type		Double	Double
	Material		High Conductivity Copper	High Conductivity Copper
	Cross Section	mm ²	To be mentioned	2400sqmm
	Nominal Current	Amp	2500	2500
	Accessories:			
	Cable Connection		4 x plug-in interface (compatible for 500 mm ² Cu Cable)	<i>As per SLD ref O-U282-BD-15-0002</i>
	Test Socket		For 3 phases	<i>No test socket but terminals for CT VT testing will be utilized</i>
	Voltage Transformer		Plug in type	<i>As per SLD ref O-U282-BD-15-0002</i>
	Surge Arrester		Plug in type	<i>As per SLD ref O-U282-BD-15-0002</i>
16	Dimension and Weight			
	Height	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Width of incomer panel	mm	≤ 800	As per General Layout ref O-U282-BD-15-0002
	Width of outgoing panel	mm	≤ 600	As per General Layout ref O-U282-BD-15-0002
	Depth	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Weight including Circuit Breaker	Kg.	To be mentioned	Approx. 1200
BUS SECTIONALIZER SWITCHGEAR UNIT:				
17	Manufacturer's Name & Address		To be mentioned	SIEMENS AG/ Germany
18	Applied standard		To be mentioned	IEC 62271-1 IEC 62271-200

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
19	Rated nominal voltage	kV	33	33
20	Rated Voltage	kV	36	36
21	Rated current for main bus	A	2500	2500
22	Rated short time current	kA	40	40
23	Short time current rated duration	Sec.	3	3
23.1	Enclosure material		Al. alloy	Aluminium alloy AlSi10Mg
24	Circuit Breaker:			
	Type		VCB	VACUUM
	Rated Voltage	kV	36	36
	Rated Current	A	2500	2500
	Operating Cycle	No.	To be mentioned	10000
	Rated short Ckt. breaking current	kA	40	40
	Rated short Ckt. making current	kA	100	100
	Rated breaking time	Cycle	3	<85msec
	Opening time	mili Sec	To be mentioned	<70msec
	Closing time	mili Sec	To be mentioned	<95msec
	Rated operating sequence		0-0.3sec-CO-3min-CO	O-0,3s-CO-3min-CO
	Control voltage	V	DC 110	DC 110
	Motor voltage for spring charge	V	AC 240	230V \pm 10%.
25	Three Position Disconnect Switch:			
	Type		To be mentioned	SIEMENS
	Rated Voltage	kV	36	36
	Rated current	A	2500	2500
	Switch Positions		Closed, Open, Earth	<i>Closed, Open, Earth</i>
	Electrical and Mechanical Interlock		As per IEC 62271-200	<i>YES</i>
26	Current Transformer:			
	Rated Voltage	kV	36	Low voltage CT outside high voltage circuit
	Accuracy class, Metering		0.2	0.2
	Accuracy class, O/C & E/F Protection		5P15	5P15
	Rated current ratio	A	2000-1000/1-1	2000-1000/1-1
	Burden	VA	15	15
27	Rated Frequency	Hz	50	50
28	Insulation level:			
	AC withstand voltage 1 min. dry	kV	70	70
	Impulse withstand, full wave	kV	170	170

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
29	Degree of Protection:			
	Enclosure		IP4X	IP31D
	HV Compartment		IP65	IP65
	LV Compartment		IP40	IP41
30	SF6 Safety and Life:			
	SF6 Pressure:			
	Rated pressure at 20°C		To be mentioned	70kPa
	Minimum functional pressure at 20°C		To be mentioned	50kPa
	Bursting Pressure		To be mentioned	Pickup pressure for bursting protection >300 kPa Bursting pressure of the enclosure > 600 kPa
	Gas Leakage Rate		To be mentioned	<0.1% p.a. (referred to the absolute gas pressure)
	Safety Indication:			Gas pressure indicators (manometers)
	Capacitive Voltage Indicator (EU/Japan/USA origin)		For 3 phases in the front or rear side of the panel	LRM per phase at the front side (EU origin)
	Gas pressure Manometer (for each phase)		As per IEC 62271-1	IEC 62271-1 IEC 62271-200
	Bus Bar Gas pressure Manometer		As per IEC 62271-1	IEC 62271-1 IEC 62271-200
	Life / Endurance of Switchgear:			
	Circuit Breakers		As per IEC 62271-100	IEC 62271-1 IEC 62271-200
	Disconnectors and Earthing Switches		As per IEC 62271-102	IEC 62271-1 IEC 62271-200
31	Bus Bar and Accessories:			
	Bus Bar:			
	Bus bar type		Double	Double
	Material		High Conductivity Copper	High Conductivity Copper
	Cross Section	mm ²	To be mentioned	2400sqmm
	Nominal Current	Amp	2500	2500
	Accessories:			

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
	Test Socket		<i>For 3 phases</i>	<i>No test socket but terminals for CT VT testing will be utilized</i>
	Voltage Transformer		Plug in type	<i>As per SLD ref O-U282-BD-15-0002</i>
	Surge Arrester		Plug in type	<i>Not Applicable</i>
32	Dimension and Weight			
	Height	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Width	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Depth	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Weight including Circuit Breaker	Kg.	To be mentioned	Approx 1200kgs
TRANSFORMER FEEDER SWITCHGEAR UNITS				
33	Manufacturer's Name & Address		To be mentioned	SIEMENS AG/ Germany
34	Applied standard		To be mentioned	IEC 62271-1 IEC 62271-200
35	Rated nominal voltage	kV	33	33
36	Rated Voltage	kV	36	36
37	Rated current for main and reserve bus each	A	2500	2500
38	Rated short time current	kA	40	40
39	Short time current rated duration	Sec.	3	3
39..1	Enclosure material		Al. Alloy	Aluminium alloy AlSi10Mg
40	Circuit Breaker:			
	Type		VCB	VACUUM
	Rated Voltage	kV	36	36
	Rated Current	A	1250	1250
	Rated short Ckt. breaking current	kA	40	40
	Rated short Ckt. making current	kA	100	100
	Rated breaking time	Cycle	3	<85msec
	Opening time	mili Sec	To be mentioned	<70msec
	Closing time	mili Sec	To be mentioned	<95msec
	Rated operating sequence		0-0.3sec-CO-3min-CO	O-0,3s-CO-3min-CO
	Control voltage	V	DC 110	DC 110
	Motor voltage for spring charge	V	AC 240	230V±10%.
41	Three Position Disconnecter			

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
	Switch:			
	Type		To be mentioned	SIEMENS
	Rated Voltage	kV	36	36
	Rated current	A	1250	1250
	Switch Positiions		Closed, Open, Earth	<i>Closed, Open, Earth</i>
	Electrical and Mechanical Interlock		As per IEC 62271-200	<i>YES</i>
42	Current Transformer:			
	Rated Voltage	kV	36	Low voltage CT outside high voltage circuit
	Accuracy class, Metering		0.2	0.2
	Accuracy class, O/C& E/F Protection		5P15	5P15
	Accuracy class, Differential Protection		X	X
	Rated Current Ratio	A	1200-600/1-1-1	1200-600/1-1-1
	Burden	VA	15	15
43	Rated Frequency	Hz	50	50
44	Insulation level:			
	AC withstand voltage 1 min. dry	kV	70	70
	Impulse withstand, full wave	kV	170	170
45	Degree of Protection:			
	Enclosure		IP4X	IP31D
	HV Compartment		IP65	IP65
	LV Compartment		IP40	IP41
46	SF6 Safety and Life:			
	SF6 Pressure:			
	Rated pressure at 20°C		To be mentioned	70kPa
	Minimum functional pressure at 20°C		To be mentioned	50kPa
	Bursting Pressure		To be mentioned	120kPa
	Gas Leakage Rate		To be mentioned	<0.1% p.a. (referred to the absolute gas pressure)
	Safety Indication:			Gas pressure indicators (manometers)
	Capacitive Voltage Indicator (EU/Japan/USA origin)		For 3 phases in the front side of the panel	LRM per phase at the front side (EU origin)
	Gas pressure Manometer		As per IEC 62271-1	IEC 62271-1 IEC 62271-200

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
	Bus Bar Gas pressure Manometer		As per IEC 62271-1	IEC 62271-1 IEC 62271-200
	Life / Endurance of Switchgear:			
	Circuit Breakers		As per IEC 62271-100	IEC 62271-1 IEC 62271-200
	Disconnectors and Earthing Switches		As per IEC 62271-102	IEC 62271-1 IEC 62271-200
47	Bus Bar and Accessories:			
	Bus Bar:			
	Bus bar type		Single	Double
	Material		High Conductivity Copper	High Conductivity Copper
	Cross Section	mm ²	To be mentioned	2400sqmm
	Nominal Current	Amp	2500	2500
	Accessories:			
	Cable Connection		1 x plug-in interface (Compatible for 500 mm ² Cu Cable)	<i>As per SLD ref O-U282-BD-15-0002</i>
	Test Socket		For 3 phases	<i>No test socket but terminals for CT VT testing will be utilized</i>
	Surge Arrester		Single phase Plug in type	<i>As per SLD ref O-U282-BD-15-0002</i>
48	Dimension and Weight			
	Height	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Width	mm	≤ 600	As per General Layout ref O-U282-BD-15-0002
	Depth	mm	To be mentioned	As per General Layout ref O-U282-BD-15-0002
	Weight including Circuit Breaker	Kg.	To be mentioned	Approx 1200kgs
VOLTAGE TRANSFORMER SWITCHGEAR UNITS:				
49	Type		To be mentioned	On Busbar: 4MU4 On cable side: 4MU3 with cable connection between panel and VT (VT to be installed outside of the panel)
50	Installation		Plug in type and panel mounted	4MU4 plug on busbar 4MU3 outside of

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
				the panel connection, plugs at both ends of the cable.
51	Busbar:			
	Material		Copper	copper
	Cross section	mm2		2400 mm2
52	Rated nominal voltage	kV	33	33
53	Rated Voltage	kV	36	36
54	Rated current for main & reserve bus	A	2500	2500
55	Rated short time current	kA	40	40
56	Short time current rated duration	Sec.	3	3
57	Voltage Transformer:			
	Number of phase	No.	3	3
	Rated primary voltage	kV	33/√3	33/√3
	Rated secondary voltage	V	110/√3	110/√3
	Rated tertiary voltage	V	110/√3	110/√3
	Rated burden, Secondary	VA	100	30 VA for VT on BB 25 VA for VT on cable side
	Accuracy class		0.2, 3P	0.2, 3P
58	Power Fuse:			
	Rated voltage	kV	36	Not applicable since no fuses are used
	Rated current	A	0.5	Not applicable since no fuses are used
	Rated short Ckt. breaking current	kA	40	Not applicable since no fuses are used
59	Dimension and Weight:			
	Height	mm	To be mentioned	2350 mm
	Width	mm	To be mentioned	9304 mm (complete switchgear arrangement)
	Depth	mm	To be mentioned	2665 mm
	Wt. including voltage transformer	Kg.	To be mentioned	App. 800 kg per panel App. 12.000,00 kg for the complete arrangement.

Sl No	Description	Unit	EMPLOYER Requirement	Manufacturer's guaranteed Particulars
60	Degree of Protection			
	Insulation Level	kV	To be mentioned	70 kV 170 kV/ BIL
	Winding Connection		To be mentioned	VT Connection is as per Inductive Type
	Maximum Ratio Error		To be mentioned	Accuracy Class 0.2
	Earthing System		Solidly Earthed	Solidly Earthed

Customer: DESCO
Project: DESCO 5 Nos. 132/33kV GIS Substation
Reference: 3313176045

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8DB10

**Gas Insulated, Metal-Enclosed
Medium-Voltage Switchgear**

Double Busbar System



Technical Description

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1 Switchgear Description

1.1. General

The offered switchgear 8DB10 is an SF₆-insulated, type-tested, single-phase metal-enclosed medium-voltage vacuum interrupter switchgear designed as double-busbar switchgear for indoor installation.

The SF₆-gas is only used as insulating, but not as quenching medium. The insulation level required is maintained inside the gas compartments without additional insulation material. Enclosures have degree of protection IP65. The single pole encapsulation with modular housings consists of corrosion-resistant aluminium housings.

The modular design allows the replacement of the panel connection housing or the circuit breaker without interrupting the main horizontal busbar operation.

The gas compartments are divided in such a way that when work is done on one busbar system, it can be completely isolated from the other busbar system (e.g. for a switchgear system expansion), the second busbar system can remain in operation with all feeders without interruption and upholding the full rated insulation level

Each closed gas compartment has its own pressure relief which prevents rupture of the housing in case of an arc fault.

The monitoring of the gas compartment is carried out with alarm contact manometers.

1.2. Panel Design

Each of the three single poles of the panel are arranged from front to back. Each pole consists of a vertical circuit breaker housing with the vacuum interrupter, two vertical three-position switch housings containing the three-position switch for the first busbar system and the disconnecter for the second busbar system and two horizontal bus housings on top.

Circuit-breaker housings, three-position switch housings, disconnecter housings and busbar housings are separated from each other with gas-tight bushings.

The cable connection compartment housing with the cable sockets is located below the circuit breaker.

1.3. Switchgear Housings

The switchgear housings consist of a corrosion-resistant high nickel content aluminium alloy and are assembled using O-rings for gas tightness.

The rated operating pressure amount of max. 130 kPa relative gas pressure (depends on isolation level and rated current) at 20° C.

The individual gas compartments are monitored using alarm contact manometers.

1.4. Circuit-Breaker

Circuit-breakers are vacuum circuit-breakers of the 3AH4 product series. The circuit breaker operating drive and the vacuum switching interrupter are maintenance-free up to 10,000 switching cycles as a standard design.

The maintenance-free operating mechanism has the following equipment features:

- Motor charged stored-energy spring operated mechanism with auto-reclosing capability.
- "Trip-Free" according to IEC 6227-100
- Auxiliary switch contacts for control / signaling as specified in the Scope of Supply, Chapter 5.

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- Operations counter
- Circuit breaker trip solenoid
- Circuit breaker close solenoid
- Auxiliary switch contacts for control / signalling as specified in the Scope of Supply, Chapter 5.
- 'Spring charged' indication
- Open/close mechanical position indication
- Mechanical OFF pushbutton
- Mechanical ON pushbutton
- The mechanical grounding lever is lockable and tagable for a grounded feeder circuit.

Endurance class of circuit-breaker:

Function	Class	Standard	Properties
BREAKING	M2	IEC 62271-100	10,000 x Mechanically without maintenance *
	E2	IEC 62271-100	10,000 x rated normal current without maintenance *
	C2	IEC 62271-100	50 x rated short-circuit breaking current without maintenance
			Very low probability of restrikes

* Option: 30.000 operating cycles

1.5. Three Position Switch

1.5.1. Three Position Switch

To reduce moving parts, the disconnecter and grounding switches are designed as single three-position switches. In combination with the circuit-breaker, the non-load break three-position switch is used for fault close (make-proof) feeder grounding.

The disconnecter / ground stationary and movable contacts are mounted in separate disconnecter housings. Mechanical coupling is made through an external shaft.

The three-position switch operating mechanism are located on the panel front. For the two operating functions (disconnecting and grounding) separate interlocked operating handles are provided.

The maintenance-free operating mechanism has the following equipment features:

- Manual or optional motor operating mechanism as specified in the Scope of Supply, Chapter 5
- Auxiliary contacts for disconnecter switch: 4NO + 4NC + 2CO
- Auxiliary contacts for grounding switch: 2NO + 2NC + 4CO
- Mechanical switch position indication for connected and grounding switch positions
- Manual operation with mechanical interlock to the circuit-breaker
- Locking device as specified in the Scope of Supply, Chapter 5

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Endurance class of three-position disconnecter:

Function	Class	Standard	Properties
DISCONNECTING	M1	IEC 62271-102	2.000 x mechanically without maintenance
READY-TO-GROUND			1,000 x mechanically without maintenance
GROUNDING	E2 ¹⁾	IEC 62271-102	50 x rated short-circuit making current I_{ma} without maintenance

¹⁾ By closing the circuit-breaker

1.5.2. Tie-breaker and tie-riser three Position Switch

In combination with the circuit-breaker, the three-position switch of busbar system 1 is for fault close (make-proof) grounding of the bus.

From the operating front, the three-position switch of busbar system 2 in the feeder is provided as a disconnecter with only 2 positions. The grounding position can be attained by decoupling from the operating mechanism during repair work.

In the sectionalizing and coupling configurations, both system disconnectors are of three-position switch design in order to ensure fault close (make-proof) grounding of the busbars with the tie switch.

1.6. Interlocks

1.6.1. Vertical section internal interlocking

The combination of non load-break three-position switch and circuit-breaker meet the following vertical section internal interlock conditions:

The three-position switch can only be operated to ready-to-ground position if the circuit-breaker is in the open position.

Three-position switch (System 1) and disconnecter (System 2) are mutually interlocked so that only one can be operated. If one switching device is in the intermediate (fault position), the other cannot be actuated.

If the three-position switch (System 1) is in the "ready-to-earth" position, the disconnecter (System 2) can not be actuated.

The three-position switch can only be brought into the ready-to-earth position if the disconnecter and circuit-breaker are open.

The three-position switch is prevented from switching through from the CLOSED state into the "ready-to-earth" state.

Closing of the circuit breaker is blocked if the three-position switch (system 1) or disconnecter (system 2) are in an intermediate position.

1.6.2. Vertical section internal and overall interlocking

All internal vertical section interlocks are mechanical. In tie-breaker and tie-riser sections, additional electromagnetic interlocks are provided. If the control voltage fails, an interlocked emergency operation of the feeder is possible.

1.6.3. Grounding of the feeder

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For grounding of the feeder, reliable "verification interlocking" is provided: Only after the three-position switch has been switched into the "ready-to-ground" position can the feeder be grounded by closing the circuit-breaker.

The remote control and protective relay tripping operation of the circuit breaker are automatically disabled as soon as the three-position switch is switched to the "ready-to-ground" position and the feeder grounded locking device is padlocked.

A "feeder grounded" locking device prevents the local mechanical and electrical tripping by blocking the tripping mechanism of the circuit breaker mechanically.

1.6.4. Un-grounding of the feeder

Once grounded, the feeder remains in the grounded position.

The locking device is removed and the circuit-breaker must be manually opened with the mechanical OPEN push-button of the circuit-breaker.

The three-position switch can be operated as described above.

1.7. Power Cable Connection

Power cable connections are accessible from below from an elevated platform / mezzanine or the cable vault. Cable connections are designed for fully insulated inside cone connections as per DIN EN 50181.

There is a variety of combinations for cable connections for single-core or multiple-core cables per phase with the cable sizes 2/0 AWG through 1000 kcmil.

Iso-phase bus-bar connections can be made with solid-insulated bus-bars or with gas-insulated bus-bars.

Quoted equipment is specified in the Scope of Supply, Chapter 5

The following suppliers are released:

Company	Type of cable plugs
Pfisterer	CONNEX size 2, size 3 and size 4
Südkabel	SEIK
nkt cables	CPI 2, CPI 3
Tyco Electronics	RPIT-2, RPIT-3

1.8. Current Transformers

Current transformers are designed as toroidal current transformers. The CTs are mounted on the outside of the single phase aluminum housing, without any dielectric or thermal stresses.

Current transformers are specified in the Scope of Supply, Chapter 5

1.9. Voltage Transformers

Voltage transformers are designed as inductive, cast-resin insulated voltage transformers in metal-enclosed safe-to-touch design. The VTs are located outside the gas compartments.

The voltage transformers can get connected to the busbar directly or over a three position switch

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Voltage transformers for feeders can be plugged directly or connected through a separate cable at the cable connection.

Voltage transformers are specified in the Scope of Supply, Chapter 5

1.10. Busbar

The busbar consists of profile copper.

1.11. Low-voltage Compartment

Low-voltage compartments are located on the vertical section front above the operating mechanisms of the circuit-breaker and the three-position switch (system 1) and disconnector (system 2). The electrical control connections from section to section are made via flexible cable harnesses. Control wiring is run in a wire-way located at the top of the LV compartment.

Internal vertical section wires run in metal-enclosed wiring ducts. The metal-enclosed wiring ducts are located on the left and on the right in the front part of the switchgear enclosure and are accessible from the front.

Inside the low-voltage compartment, secondary equipment is mounted on a rear mounting plate or on a DIN-rail system. Individual secondary devices can be integrated in the door of the low-voltage compartment.

Wiring is performed as specified in the Scope of Supply, Chapter 5

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2 Special Switchgear Features

2.1. Operational Reliability

The gas-tight enclosure of all live parts from to busbar down to the cable excludes any external influences on the primary part.

Single-pole enclosure and long-time experience in the application of this switchgear has proven its exceptional operational reliability.

2.2. Personnel Safety

Personnel safety is achieved by internal single-pole enclosure of the primary circuit tested to ANSI / IEEE C37.20.7-2007 type 2B internal arc-resistant design.

2.3. Environmental Independence

Due to the gas-tight enclosure, 8DB10 is almost insensitive to environmental effects. Moreover, the dielectric strength (BIL) and rated voltage are independent of the site altitude.

2.4. Environmental Compatibility

The switchgear forms a hermetically sealed system in accordance with IEC 62271 part 1 over the complete life time of the unit, i.e. the SF₆ gas exchanging is not necessary under normal operating conditions.

2.5. Compactness

The low pressure SF₆ insulation enables very compact dimensions, offering at the same time a high switchgear performance. This provides an economical utilization of floor space, especially in cities and metropolitan areas for both existing rooms and new buildings.

2.6. Modularity

The modularity of the switchgear allows e.g. to replace the circuit-breaker module without isolating the busbars. For switchgear extensions, only one busbar must be disconnected.

Due to its modular design 8DB10 shows a high re-availability even in case of fault.

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3 Standards

		IEC-Standard EN-Standard	Title
Switchgear		62 271-1	High-voltage switchgear and controlgear – Part 1: Common specifications
		62 271-200	A.C. metal- enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV
Switching devices	Circuit-breakers	62 271-100	High-voltage alternating-current circuit-breakers
	Disconnectors and earthing switches	62 271-102	High-voltage alternating current disconnectors and earthing switches
Voltage detecting systems		61 243-5	Voltage detecting systems (VDS)
Surge arresters Surge limiters		60 099	Surge arresters
Degree of protection		60 262	Degrees of protection by enclosures (IP Code)
Degree of protection		60 529	Degrees of protection by enclosures (IK Code)
Insulation		60 071	Insulation co-ordination
Instrument transformers		61 869-1	Instrument transformers
		61 869-2	Current transformers
		61 869-3	Voltage transformers
SF ₆		60 376	Specification of technical grade sulphur hexafluoride (SF ₆) for use in el. equipment
		62 271-4	Use and handling of sulphur hexafluoride (SF ₆)
Installation		61 936-1	Power installations exceeding 1 kV
Environmental conditions		60 721-3-3	Classification of environmental conditions
Operation		EN 50 110	Operation of electrical installations

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4 Technical Data

Voltages

Rated voltage	36.0 kV
Operating voltage	33.0 kV
Rated short-duration power-frequency withstand voltage.....	70 kV
Rated lightning impulse withstand voltage.....	170 kV
Rated frequency	50 Hz

Short-circuit ratings

Rated short-time withstand current	40 kA
Rated peak withstand current	100 kA
Rated duration of short-circuit	3 s
Rated short-circuit making current (max.).....	100 kA
Rated short-circuit breaking current.....	40 kA

Current ratings

Rated normal current of the busbar	2500 A
Max. permissible busbar current at 40 °C.....	2700 A

General switchgear data

Type of arrangement.....	Free-standing arrangement without rear walls
Degree of protection (operation).....	IP31D (IP41 for LV compartment)
Degree of protection, primary part.....	IP65
Partition class	PM
Loss of service continuity	LSC 2
Internal arc classification.....	IAC A FL 40 kA 1 s
Exterior section standard colour	
Mimic diagram colour.....	black/red (standard)
Vertical section width	600 mm
Vertical section depth.....	2665 mm
Vertical section height with low-voltage compartment	2700 mm
Height of switchgear room (min.).....	
.....	2900 mm
Width of control aisle (min.).....	800 mm
Min./Max. ambient air temperature for operation	
.....	-5 °C/55 °C
Min./Max. ambient air temperature for storage and transport.....	
.....	-25 °C/70 °C

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5 Scope of Supply

The switchgear is designed as a double-busbar switchgear according to the enclosed single-line diagram.

Item No.	Quantity	Typical No.	Description
5.1	3	=HZ01	Circuit-breaker panel 2500 A
5.2	6	=HZ02	Circuit-breaker panel 1250 A
5.3	1	=HZ02a	Circuit-breaker panel 1250 A
5.4	1	=HZ02b	Circuit-breaker panel 1250 A
5.5	1	=HZ03	Bus coupler, Circuit-breaker panel 2500 A
5.6	3	=HZ04	Circuit-breaker panel 1250 A
5.7	1	=HZ00	<i>Switchgear accessories</i>

In case of particularly customer-specific design it might be possible that individual points of the switchgear description are not valid anymore.

The offered scope of supply is equipped in detail as follows:

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Item No.	Quantity	Description	Typical No.
5.1	3	Circuit-breaker panel 2500 A Maximum permissible feeder current at 40 °C: 2500 A	=HZ01
5.1.1		Busbar system Single-pole insulated busbars for double-busbar system	
5.1.2		Panel construction	
5.1.2.1	1	Three-position disconnecter (System 1) Switching position ON-OFF-EARTHED, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO Free auxiliary contacts earthing switch: 4NO + 4NC + 2CO Two-position disconnecter (System 2) Switching position ON-OFF, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO with Locking device at the disconnecter and earthing switch (separate function)	
5.1.2.2	1	Vacuum circuit-breaker Vacuum interrupter inside the switching pole compartment, motor operating stored-energy mechanism installed at panel front. Rated voltage: 36.0 kV Rated short-time withstand current: 40 kA Rated current: 2500 A With motor operating stored-energy mechanism Rated operating sequence O - 0,3 s - CO - 3 min - CO with 2 shunt releases Auxiliary voltage of motor-drive AC 230 V Auxiliary voltage of closing solenoid DC 110 V Auxiliary voltage of 1st shunt release DC 110 V Auxiliary voltage of 2 nd shunt release DC 110 V Free contacts of auxiliary switch 7NO + 4NC + 2CO with mechanical switching ON mechanism, padlockable and sealable with mechanical switching OFF mechanism, padlockable and sealable Circuit breaker / Locking device "Feeder earthed" only possible in position "Earthing switch ON"	

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- 5.1.2.3 3 **Current transformers at feeder (B) (B bzw. C1)**
 Current transformer type: 4MC4_90
 Designed as a ring-core current transformer, single-pole, inductive type, climate-independent, secondary connection via terminal strip inside the low-voltage compartment of the panel.
 Arranged outside the primary enclosure.
 Current transformer installation in the panel
 for Switchgear: 8DADB
 Rated short-time withstand current: 40 kA
 With routine test certificate
 1,2 x rated current
 Maximum core dimension: 190 mm
 1. Core: 2000 A-1000 A / 1 A
 15-7.5 VA / Class: 0.2
 Resistance of secondary winding: 7.5-3.5 Ω
 at 75°C
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 2. Core: 2000 A-1000 A / 1 A
 15-7.5 VA / Class: 5P / 15
 Resistance of secondary winding: 10.2-4.9 Ω
 at 75°C
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 3. Core: 2000 A-1000 A / 1 A
 Class: PX
 Knee Voltage: 700-700 V
 Resistance of secondary winding: 22.5-11 Ω
 at 75°C
 Magnetizing current: 10-12 mA
 at Voltage: 700-700 V
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
- 5.1.3 **Panel connection**
- 5.1.3.1 1 **Panel connection at feeder**
 by 4 cable per phase plug size 3
- 5.1.3.2 1 **Capacitive voltage detecting system at the feeder**
 Design:
 LRM system (low-resistance modified) with integrated indicator, with integrated repeat test of the interface, with integrated function test, with integrated signaling relay, type CAPDIS S2+ for the chosen operating voltage
- 5.1.3.3 3 **Voltage transformers at the feeder (short cable connection)**
 Voltage transformer type: 4MU3
 Single-pole plug-in design, inductive type, climate-independent, secondary connection by means of plugs, primary connection via plug-in cable link.
 Length: 3 m

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Arranged outside the primary enclosure.
 3 x single-pole
 Metal-enclosed
 1. Winding
 Primary voltage: 33.0 kV
 Secondary voltage: 110 / v3 V
 Rating and class: 25 VA / 0.2
 2. Winding
 Primary voltage: 33.0 kV
 Secondary voltage: 110 / v3 V
 Rating and class: 25 VA / 3P
 With routine test certificate

5.1.4

Low-voltage compartment

Height: 1200 mm

- | | |
|---|---|
| 1 | 5SY5102-7 |
| | mcb, 1-pole, 2A |
| 1 | 5ST3010 |
| | auxil.contact 1NO+1NC |
| 1 | 5SY5101-7 |
| | mcb, 1-pole, 1A |
| 1 | 5ST3010 |
| | auxil.contact 1NO+1NC |
| 2 | 5SY5206-7 |
| | mcb, 2-pole, 6A |
| 3 | 5ST3010 |
| | auxil.contact 1NO+1NC |
| 1 | 5SY5106-7 |
| | mcb, 1-pole, 6A |
| 1 | RZH:TH-H |
| | thermostat 10A/250V AC, 1 NC |
| 1 | RZH:00102020KB0 |
| | switch cabinet heater 20W without thermostat |
| 1 | LYQ:LED04-S-E224 |
| | LED-lamp 4W, 230V AC |
| 1 | 3AX4206 |
| | miniature position switch |
| 4 | 3SB3201-0AA41 |
| | pushbutton green 22mm, 1NO+1NC, complete |
| 4 | 3SB3400-0D |
| | actuator with 2NO |
| 6 | 3SB3922-0AV |
| | accessories for inscription plate 12,5x27mm |
| 4 | 3SB3201-0AA21 |
| | pushbutton red 22mm, 1NO+1NC, complete |
| 4 | 3SB3400-0D |
| | actuator with 2NO |
| 4 | 3SB3922-0AV |
| | accessories for inscription plate 12,5x27mm |
| 1 | 3SB3001-6AA20 |
| | signal lamp assembly, red |
| 1 | 3SB3001-6AA40 |
| | signal lamp assembly, green |
| 1 | TAU:913K131306EG |
| | LED Cluster, base BA 9S L, grün, 110-130V AC/DC |

[illegible]

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- 5 auxiliary relay 110V DC, 4NO
3RT2916-1DG00
- 5 surge supressor suppression diode 12-250V DC
3RH2122-1BF40
- 5 auxiliary relay 110V DC, 2NO+2NC
3RT2916-1DG00
- 2 surge supressor suppression diode 12-250V DC
3RH2911-1GA31
- 4 auxiliary switch block, side, 3NO+1NC
3RH2122-1BF40
- 2 auxiliary relay 110V DC, 2NO+2NC
3RH2911-1GA31
- 4 auxiliary switch block, side, 3NO+1NC
3RT2916-1DG00
- 2 surge supressor suppression diode 12-250V DC
3RV1611-1DG14
- 2 circuit breaker for voltage transformer 3-pole 3A
3RV1901-1A
- 1 auxil. switch 1NO+1NC
3RH2122-1AP00
- 3 auxiliary relay 230V AC, 2NO+2NC
3RH2911-1GA22
- 1 auxiliary switch block, side, 2NC+2NO
3RT2916-1BD00
- varistor 150-250VDC, 127-240VAC

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Item No.	Quantity	Description	Typical No.
5.2	6	Circuit-breaker panel 1250 A Maximum permissible feeder current at 40 °C: 1350 A	=HZ02
5.2.1		Busbar system Single-pole insulated busbars for double-busbar system	
5.2.2		Panel construction	
5.2.2.1	1	Three-position disconnecter (System 1) Switching position ON-OFF-EARTHED, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO Free auxiliary contacts earthing switch: 4NO + 4NC + 2CO Two-position disconnecter (System 2) Switching position ON-OFF, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO with Locking device at the disconnecter and earthing switch (separate function)	
5.2.2.2	1	Vacuum circuit-breaker Vacuum interrupter inside the switching pole compartment, motor operating stored-energy mechanism installed at panel front. Rated voltage: 36.0 kV Rated short-time withstand current: 40 kA Rated current: 1250 A With motor operating stored-energy mechanism Rated operating sequence O - 0,3 s - CO - 3 min - CO with 2 shunt releases Auxiliary voltage of motor-drive AC 230 V Auxiliary voltage of closing solenoid DC 110 V Auxiliary voltage of 1st shunt release DC 110 V Auxiliary voltage of 2 nd shunt release DC 110 V Free contacts of auxiliary switch 7NO + 4NC + 2CO with mechanical switching ON mechanism, padlockable and sealable with mechanical switching OFF mechanism, padlockable and sealable Circuit breaker / Locking device "Feeder earthed" only possible in position "Earthing switch ON"	

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- 5.2.2.3 3 **Current transformers at feeder (B) (B bzw. C1)**
 Current transformer type: 4MC4_90
 Designed as a ring-core current transformer, single-pole, inductive type, climate-independent, secondary connection via terminal strip inside the low-voltage compartment of the panel.
 Arranged outside the primary enclosure.
 Current transformer installation in the panel
 for Switchgear: 8DADB
 Rated short-time withstand current: 40 kA
 With routine test certificate
 1,2 x rated current
 Maximum core dimension: 190 mm
 1. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 0.2
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 2. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 5P / 15
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 3. Core: 1200 A-600 A / 1 A
 Class: PX
 Knee Voltage: 700-700 V
 Resistance of secondary winding: 40-40 Ω
 at 75°C
 Magnetizing current: 40-80 mA
 at Voltage: 700-700 V
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
- 5.2.3 **Panel connection**
- 5.2.3.1 1 **Panel connection at feeder**
 by 2 cable per phase plug size 3
- 5.2.3.2 1 **Capacitive voltage detecting system at the feeder**
 Design:
 LRM system (low-resistance modified) with integrated indicator, with integrated repeat test of the interface, with integrated function test, with integrated signaling relay, type CAPDIS S2+ for the chosen operating voltage
- 5.2.3.3 3 **Surge arrester**
 Surge arrester Connex size 2
 Rated discharge current 10 kA
 Rated voltage Ur 30 kV
 Continuous load voltage Uc 24 kV
 company Pfisterer
- 5.2.4 **Low-voltage compartment**
 Height: 1200 mm

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1	5SY5102-7
	mcb, 1-pole, 2A
1	5ST3010
	auxil.contact 1NO+1NC
1	5SY5101-7
	mcb, 1-pole, 1A
1	5ST3010
	auxil.contact 1NO+1NC
2	5SY5206-7
	mcb, 2-pole, 6A
3	5ST3010
	auxil.contact 1NO+1NC
1	5SY5106-7
	mcb, 1-pole, 6A
1	RZH:TH-H
	thermostat 10A/250V AC, 1 NC
1	RZH:00102020KB0
	switch cabinet heater 20W without thermostat
1	LYQ:LED04-S-E224
	LED-lamp 4W, 230V AC
1	3AX4206
	miniature position switch
4	3SB3201-0AA41
	pushbutton green 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
6	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
4	3SB3201-0AA21
	pushbutton red 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
4	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
1	3SB3001-6AA20
	signal lamp assembly, red
1	3SB3001-6AA40
	signal lamp assembly, green
1	TAU:913K131306EG
	LED Cluster, base BA 9S L, grün, 110-130V AC/DC
1	TAU:913K131306ER
	LED Cluster, base BA 9S L, red, 110-130V AC/DC
2	3SB3400-1A
	lampholder BA 9S
1	SGO:03503.0-01/13A
	electrical socket SD 035 series
1	7KM2112-0BA00-3AA0
	digital metering system SENTRON PAC3200
2	7PA3032-1AA00-1
	trip supervision relay 110VDC, 2CO
1	7PA2331-1
	fast LOCK-OUT relay 110VDC, 4CO
1	EES:BSM16-54-PRX-00/-Z001
	alarm relay 96x96 mm; 110 V AC/DC; 16 reporting inputs
1	JGT:P3E021-000_3804943

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	CEWE Prometer W100
1	7SD8021-5EB90-1FA0+L0S
	line differential protection relay 7SJ80
1	7SJ85-P1J216665
	overcurrent protection relay 7SJ85
1	KNS:CH10A223-600E+F758
	selector switch 4 pole without off position, 60 degree
2	A7E0002934073
	MCU-MH NXPlusC/8DAB/NXPLUS C WKA(LS/TS)/NXPLUS
2	PHO:1700342
	4-pole control spring termination blue
2	PHO:1910982
	4-pole control spring terminal red
2	PHO:1965830
	4-pole control spring termination black
2	PHO:1773604
	5-pole control spring termination grey
1	JGT:A11
	Panel mounting kit for counter Cewe Prometer-100
1	WIE:90.100.1654.0
	circuit label 140x55mm
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
5	3RH2140-1BF40
	auxiliary relay 110V DC, 4NO
5	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
5	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
5	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC
2	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC

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- | | |
|---|---|
| 2 | 3RT2916-1DG00
surge supressor suppression diode 12-250V DC |
| 2 | 3RH2140-1BF40
auxiliary relay 110V DC, 4NO |
| 5 | 3RT2916-1DG00
surge supressor suppression diode 12-250V DC |
| 3 | 3RH2122-1BF40
auxiliary relay 110V DC, 2NO+2NC |
| 1 | 3RH2122-1AP00
auxiliary relay 230V AC, 2NO+2NC |
| 3 | 3RH2911-1GA22
auxiliary switch block, side, 2NC+2NO |
| 1 | 3RT2916-1BD00
varistor 150-250VDC, 127-240VAC |

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Item No.	Quantity	Description	Typical No.
5.3	1	Circuit-breaker panel 1250 A Maximum permissible feeder current at 40 °C: 1350 A	=HZ02a
5.3.1		Busbar system Single-pole insulated busbars for double-busbar system	
5.3.2		Panel construction	
5.3.2.1	1	Three-position disconnecter (System 1) Switching position ON-OFF-EARTHED, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO Free auxiliary contacts earthing switch: 4NO + 4NC + 2CO Two-position disconnecter (System 2) Switching position ON-OFF, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO with Locking device at the disconnecter and earthing switch (separate function)	
5.3.2.2	1	Vacuum circuit-breaker Vacuum interrupter inside the switching pole compartment, motor operating stored-energy mechanism installed at panel front. Rated voltage: 36.0 kV Rated short-time withstand current: 40 kA Rated current: 1250 A With motor operating stored-energy mechanism Rated operating sequence O - 0,3 s - CO - 3 min - CO with 2 shunt releases Auxiliary voltage of motor-drive AC 230 V Auxiliary voltage of closing solenoid DC 110 V Auxiliary voltage of 1st shunt release DC 110 V Auxiliary voltage of 2 nd shunt release DC 110 V Free contacts of auxiliary switch 7NO + 4NC + 2CO with mechanical switching ON mechanism, padlockable and sealable with mechanical switching OFF mechanism, padlockable and sealable Circuit breaker / Locking device "Feeder earthed" only possible in position "Earthing switch ON"	

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- 5.3.2.3 3 **Current transformers at feeder (B) (B bzw. C1)**
 Current transformer type: 4MC4_90
 Designed as a ring-core current transformer, single-pole, inductive type, climate-independent, secondary connection via terminal strip inside the low-voltage compartment of the panel.
 Arranged outside the primary enclosure.
 Current transformer installation in the panel
 for Switchgear: 8DADB
 Rated short-time withstand current: 40 kA
 With routine test certificate
 1,2 x rated current
 Maximum core dimension: 190 mm
 1. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 0.2
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 2. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 5P / 15
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 3. Core: 1200 A-600 A / 1 A
 Class: PX
 Knee Voltage: 700-700 V
 Resistance of secondary winding: 40-40 Ω
 at 75°C
 Magnetizing current: 40-80 mA
 at Voltage: 700-700 V
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
- 5.3.3 **Panel connection**
- 5.3.3.1 1 **Panel connection at feeder**
 by 2 cable per phase plug size 3
- 5.3.3.2 1 **Capacitive voltage detecting system at the feeder**
 Design:
 LRM system (low-resistance modified) with integrated indicator, with integrated repeat test of the interface, with integrated function test, with integrated signaling relay, type CAPDIS S2+ for the chosen operating voltage
- 5.3.3.3 3 **Surge arrester**
 Surge arrester Connex size 2
 Rated discharge current 10 kA
 Rated voltage Ur 30 kV
 Continuous load voltage Uc 24 kV
 company Pfisterer
- 5.3.4 **Low-voltage compartment**
 Height: 1200 mm

Customer: DESCO
 Project: DESCO 5 Nos. 132/33kV GIS Substation
 Reference: 3313176045

Offer 8DB10
 8DAB-45906

1	5SY5102-7
	mcb, 1-pole, 2A
1	5ST3010
	auxil.contact 1NO+1NC
1	5SY5101-7
	mcb, 1-pole, 1A
1	5ST3010
	auxil.contact 1NO+1NC
2	5SY5206-7
	mcb, 2-pole, 6A
3	5ST3010
	auxil.contact 1NO+1NC
1	5SY5106-7
	mcb, 1-pole, 6A
1	RZH:TH-H
	thermostat 10A/250V AC, 1 NC
1	RZH:00102020KB0
	switch cabinet heater 20W without thermostat
1	LYQ:LED04-S-E224
	LED-lamp 4W, 230V AC
1	3AX4206
	miniature position switch
4	3SB3201-0AA41
	pushbutton green 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
6	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
4	3SB3201-0AA21
	pushbutton red 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
4	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
1	3SB3001-6AA20
	signal lamp assembly, red
1	3SB3001-6AA40
	signal lamp assembly, green
1	TAU:913K131306EG
	LED Cluster, base BA 9S L, grün, 110-130V AC/DC
1	TAU:913K131306ER
	LED Cluster, base BA 9S L, red, 110-130V AC/DC
2	3SB3400-1A
	lampholder BA 9S
1	SGO:03503.0-01/13A
	electrical socket SD 035 series
1	7KM2112-0BA00-3AA0
	digital metering system SENTRON PAC3200
2	7PA3032-1AA00-1
	trip supervision relay 110VDC, 2CO
1	7PA2331-1
	fast LOCK-OUT relay 110VDC, 4CO
1	EES:BSM16-54-PRX-00/-Z001
	alarm relay 96x96 mm; 110 V AC/DC; 16 reporting inputs
1	JGT:P3E021-000_3804943

Customer: DESCO
 Project: DESCO 5 Nos. 132/33kV GIS Substation
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	CEWE Prometer W100
1	7SD8021-5EB90-1FA0+L0S
	line differential protection relay 7SJ80
1	7SJ85-P1J216665
	overcurrent protection relay 7SJ85
1	KNS:CH10A223-600E+F758
	selector switch 4 pole without off position, 60 degree
1	JGT:A11
	Panel mounting kit for counter Cewe Prometer-100
1	WIE:90.100.1654.0
	circuit label 140x55mm
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
5	3RH2140-1BF40
	auxiliary relay 110V DC, 4NO
5	3RT2916-1DG00
	surge suppressor suppression diode 12-250V DC
6	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
6	3RT2916-1DG00
	surge suppressor suppression diode 12-250V DC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC
2	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC
2	3RT2916-1DG00
	surge suppressor suppression diode 12-250V DC
2	A7E0002934073
	MCU-MH NXPlusC/8DAB/NXPLUS C WKA(LS/TS)/NXPLUS
2	PHO:1700342
	4-pole control spring termination blue
2	PHO:1910982
	4-pole control spring terminal red
2	PHO:1965830
	4-pole control spring termination black

Customer: DESCO
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- 2 PHO:1773604
5-pole control spring termination grey
- 2 3RH2140-1BF40
auxiliary relay 110V DC, 4NO
- 5 3RT2916-1DG00
surge supressor suppression diode 12-250V DC
- 3 3RH2122-1BF40
auxiliary relay 110V DC, 2NO+2NC
- 1 3RH2122-1AP00
auxiliary relay 230V AC, 2NO+2NC
- 3 3RH2911-1GA22
auxiliary switch block, side, 2NC+2NO
- 1 3RT2916-1BD00
varistor 150-250VDC, 127-240VAC

Customer: DESCO
 Project: DESCO 5 Nos. 132/33kV GIS Substation
 Reference: 3313176045

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Item No.	Quantity	Description	Typical No.
5.4	1	Circuit-breaker panel 1250 A Maximum permissible feeder current at 40 °C: 1350 A	=HZ02b
5.4.1		Busbar system Single-pole insulated busbars for double-busbar system	
5.4.2		Panel construction	
5.4.2.1	1	Three-position disconnecter (System 1) Switching position ON-OFF-EARTHED, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO Free auxiliary contacts earthing switch: 4NO + 4NC + 2CO Two-position disconnecter (System 2) Switching position ON-OFF, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO with Locking device at the disconnecter and earthing switch (separate function)	
5.4.2.2	1	Vacuum circuit-breaker Vacuum interrupter inside the switching pole compartment, motor operating stored-energy mechanism installed at panel front. Rated voltage: 36.0 kV Rated short-time withstand current: 40 kA Rated current: 1250 A With motor operating stored-energy mechanism Rated operating sequence O - 0,3 s - CO - 3 min - CO with 2 shunt releases Auxiliary voltage of motor-drive AC 230 V Auxiliary voltage of closing solenoid DC 110 V Auxiliary voltage of 1st shunt release DC 110 V Auxiliary voltage of 2 nd shunt release DC 110 V Free contacts of auxiliary switch 7NO + 4NC + 2CO with mechanical switching ON mechanism, padlockable and sealable with mechanical switching OFF mechanism, padlockable and sealable Circuit breaker / Locking device "Feeder earthed" only possible in position "Earthing switch ON"	

Customer: DESCO
 Project: DESCO 5 Nos. 132/33kV GIS Substation
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Offer 8DB10
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- 5.4.2.3 3 **Current transformers at feeder (B) (B bzw. C1)**
 Current transformer type: 4MC4_90
 Designed as a ring-core current transformer, single-pole, inductive type, climate-independent, secondary connection via terminal strip inside the low-voltage compartment of the panel.
 Arranged outside the primary enclosure.
 Current transformer installation in the panel
 for Switchgear: 8DADB
 Rated short-time withstand current: 40 kA
 With routine test certificate
 1,2 x rated current
 Maximum core dimension: 190 mm
 1. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 0.2
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 2. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 5P / 15
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 3. Core: 1200 A-600 A / 1 A
 Class: PX
 Knee Voltage: 700-700 V
 Resistance of secondary winding: 40-40 Ω
 at 75°C
 Magnetizing current: 40-80 mA
 at Voltage: 700-700 V
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
- 5.4.3 **Panel connection**
- 5.4.3.1 1 **Panel connection at feeder**
 by 2 cable per phase plug size 3
- 5.4.3.2 1 **Capacitive voltage detecting system at the feeder**
 Design:
 LRM system (low-resistance modified) with integrated indicator, with integrated repeat test of the interface, with integrated function test, with integrated signaling relay, type CAPDIS S2+ for the chosen operating voltage
- 5.4.3.3 3 **Surge arrester**
 Surge arrester Connex size 2
 Rated discharge current 10 kA
 Rated voltage Ur 30 kV
 Continuous load voltage Uc 24 kV
 company Pfisterer
- 5.4.4 **Low-voltage compartment**
 Height: 1200 mm

Customer: DESCO
Project: DESCO 5 Nos. 132/33kV GIS Substation
Reference: 3313176045

Offer 8DB10
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1	5SY5102-7
	mcb, 1-pole, 2A
1	5ST3010
	auxil.contact 1NO+1NC
1	5SY5101-7
	mcb, 1-pole, 1A
1	5ST3010
	auxil.contact 1NO+1NC
2	5SY5206-7
	mcb, 2-pole, 6A
3	5ST3010
	auxil.contact 1NO+1NC
1	5SY5106-7
	mcb, 1-pole, 6A
1	RZH:TH-H
	thermostat 10A/250V AC, 1 NC
1	RZH:00102020KB0
	switch cabinet heater 20W without thermostat
1	LYQ:LED04-S-E224
	LED-lamp 4W, 230V AC
1	3AX4206
	miniature position switch
4	3SB3201-0AA41
	pushbutton green 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
6	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
4	3SB3201-0AA21
	pushbutton red 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
4	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
1	3SB3001-6AA20
	signal lamp assembly, red
1	3SB3001-6AA40
	signal lamp assembly, green
1	TAU:913K131306EG
	LED Cluster, base BA 9S L, grün, 110-130V AC/DC
1	TAU:913K131306ER
	LED Cluster, base BA 9S L, red, 110-130V AC/DC
2	3SB3400-1A
	lampholder BA 9S
1	SGO:03503.0-01/13A
	electrical socket SD 035 series
1	7KM2112-0BA00-3AA0
	digital metering system SENTRON PAC3200
2	7PA3032-1AA00-1
	trip supervision relay 110VDC, 2CO
1	7PA2331-1
	fast LOCK-OUT relay 110VDC, 4CO
1	EES:BSM16-54-PRX-00/-Z001
	alarm relay 96x96 mm; 110 V AC/DC; 16 reporting inputs
1	JGT:P3E021-000_3804943

Customer: DESCO
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	CEWE Prometer W100
1	7SD8021-5EB90-1FA0+L0S
	line differential protection relay 7SJ80
1	7SJ85-P1J216665
	overcurrent protection relay 7SJ85
1	KNS:CH10A223-600E+F758
	selector switch 4 pole without off position, 60 degree
1	JGT:A11
	Panel mounting kit for counter Cewe Prometer-100
1	WIE:90.100.1654.0
	circuit label 140x55mm
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
5	3RH2140-1BF40
	auxiliary relay 110V DC, 4NO
5	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
6	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
6	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC
2	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC
2	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
2	A7E0002934073
	MCU-MH NXPlusC/8DAB/NXPLUS C WKA(LS/TS)/NXPLUS
2	PHO:1700342
	4-pole control spring termination blue
2	PHO:1910982
	4-pole control spring terminal red
2	PHO:1965830
	4-pole control spring termination black

Customer: DESCO
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- 2 PHO:1773604
5-pole control spring termination grey
- 2 3RH2140-1BF40
auxiliary relay 110V DC, 4NO
- 5 3RT2916-1DG00
surge supressor suppression diode 12-250V DC
- 3 3RH2122-1BF40
auxiliary relay 110V DC, 2NO+2NC
- 1 3RH2122-1AP00
auxiliary relay 230V AC, 2NO+2NC
- 3 3RH2911-1GA22
auxiliary switch block, side, 2NC+2NO
- 1 3RT2916-1BD00
varistor 150-250VDC, 127-240VAC

Customer: DESCO
 Project: DESCO 5 Nos. 132/33kV GIS Substation
 Reference: 3313176045

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Item No.	Quantity	Description	Typical No.
5.5	1	Bus coupler, Circuit-breaker panel 2500 A Maximum permissible feeder current at 40 °C: 2500 A	=HZ03
5.5.1		Busbar system Single-pole insulated busbars for double-busbar system	
5.5.1.1	3	Voltage transformers at the busbar system 1 Voltage transformer type: 4MU4 Single-pole plug-in design, inductive type, climate-independent, secondary connection by means of plugs. Arranged outside the primary enclosure. with three-position disconnecter Switching positions voltage transformer ON-OFF-EARTHED, installation within SF6-filled busbar compartment, mechanism outside the gas compartment With motor operating mechanism Voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Voltage of electromagnetic interlock: DC 110 V Locking device at the disconnecter and earthing switch (separate function) Free auxiliary contacts disconnecter switch 4NO + 4NC + 2CO Free auxiliary contacts earthing switch: 4NO + 4NC + 2CO 3 x single-pole Metal-enclosed 1. Winding Primary voltage: 33.0 kV Secondary voltage: 110 / $\sqrt{3}$ V Rating and class: 30 VA / 0.2 2. Winding Primary voltage: 33.0 kV Secondary voltage: 110 / $\sqrt{3}$ V Rating and class: 30 VA / 3P With routine test certificate	
5.5.1.2	3	Voltage transformers at the busbar system 2 Voltage transformer type: 4MU4 Single-pole plug-in design, inductive type, climate-independent, secondary connection by means of plugs. Arranged outside the primary enclosure. with three-position disconnecter Switching positions voltage transformer ON-OFF-EARTHED, installation within SF6-filled busbar compartment, mechanism outside the gas compartment With motor operating mechanism	

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Voltage of motor operating mechanism: AC 230 V
 With electromagnetic interlocking at the disconnecter and earthing switch
 Voltage of electromagnetic interlock: DC 110 V
 Locking device
 at the disconnecter and earthing switch
 (separate function)
 Free auxiliary contacts disconnecter switch
 4NO + 4NC + 2CO
 Free auxiliary contacts earthing switch:
 4NO + 4NC + 2CO
 3 x single-pole
 Metal-enclosed
 1. Winding
 Primary voltage: 33.0 kV
 Secondary voltage: 110 / $\sqrt{3}$ V
 Rating and class: 30 VA / 0.2
 2. Winding
 Primary voltage: 33.0 kV
 Secondary voltage: 110 / $\sqrt{3}$ V
 Rating and class: 30 VA / 3P
 With routine test certificate

5.5.2 Panel construction

5.5.2.1 2 **Three-position disconnecter (System 1 and 2)**
 Switching position ON-OFF-EARTHED, installation in a separate compartment, mechanism outside the gas compartment
 With motor operating mechanism
 Auxiliary voltage of motor operating mechanism: AC 230 V
 With electromagnetic interlocking at the disconnecter and earthing switch
 Auxiliary voltage of electromagnetic interlock: DC 110 V
 Free auxiliary contacts disconnecter switch:
 4NO + 4NC + 2CO
 Free auxiliary contacts earthing switch:
 4NO + 4NC + 2CO
 with Locking device at the disconnecter and earthing switch (separate function)

5.5.2.2 1 **Vacuum circuit-breaker**
 Vacuum interrupter inside the switching pole compartment, motor operating stored-energy mechanism installed at panel front.
 Rated voltage: 36.0 kV
 Rated short-time withstand current: 40 kA
 Rated current: 2500 A
 With motor operating stored-energy mechanism
 Rated operating sequence O - 0,3 s - CO - 3 min - CO
 with 2 shunt releases
 Auxiliary voltage of motor-drive AC 230 V
 Auxiliary voltage of closing solenoid DC 110 V
 Auxiliary voltage of 1st shunt release DC 110 V
 Auxiliary voltage of 2 nd shunt release DC 110 V
 Free contacts of auxiliary switch 7NO + 4NC + 2CO
 with mechanical switching ON mechanism, padlockable and sealable
 with mechanical switching OFF mechanism, padlockable and sealable

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Circuit breaker / Locking device "Feeder earthed" only possible in position "Earthing switch ON"

- 5.5.2.3 3 **Current transformers at feeder (B) (B bzw. C1)**
 Current transformer type: 4MC4_40
 Designed as a ring-core current transformer, single-pole, inductive type, climate-independent, secondary connection via terminal strip inside the low-voltage compartment of the panel.
 Arranged outside the primary enclosure.
 Current transformer installation in the panel for Switchgear: 8DADB
 Rated short-time withstand current: 40 kA
 With routine test certificate
 1,2 x rated current
 Maximum core dimension: 284 mm
 1. Core: 2000 A-1000 A / 1 A
 15-7.5 VA / Class: 0.2
 Resistance of secondary winding: 10.7-5.2 Ω at 75°C
 Connection wires length: 3.6 m
 Used in Phase L1 L2 L3
 2. Core: 2000 A-1000 A / 1 A
 15-7.5 VA / Class: 5P / 15
 Resistance of secondary winding: 9.7-4.7 Ω at 75°C
 Connection wires length: 3.6 m
 Used in Phase L1 L2 L3
- 5.5.3 **Panel connection**
- 5.5.3.1 1 **Capacitive voltage detecting system at the feeder**
 Design:
 LRM system (low-resistance modified) with integrated indicator, with integrated repeat test of the interface, with integrated function test, with integrated signaling relay, type CAPDIS S2+ for the chosen operating voltage
- 5.5.4 **Low-voltage compartment**
 Height: 1200 mm
- | | |
|---|-----------------------|
| 1 | 5SY5102-7 |
| | mcb, 1-pole, 2A |
| 1 | 5ST3010 |
| | auxil.contact 1NO+1NC |
| 2 | 5SY5101-7 |
| | mcb, 1-pole, 1A |
| 2 | 5ST3010 |
| | auxil.contact 1NO+1NC |
| 3 | 5SY5206-7 |
| | mcb, 2-pole, 6A |
| 4 | 5ST3010 |
| | auxil.contact 1NO+1NC |
| 1 | 5SY5106-7 |
| | mcb, 1-pole, 6A |

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1	RZH:TH-H
	thermostat 10A/250V AC, 1 NC
1	RZH:00102020KB0
	switch cabinet heater 20W without thermostat
1	LYQ:LED04-S-E224
	LED-lamp 4W, 230V AC
1	3AX4206
	miniature position switch
4	3SB3201-0AA41
	pushbutton green 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
6	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
4	3SB3201-0AA21
	pushbutton red 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
4	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
1	3SB3001-6AA20
	signal lamp assembly, red
1	3SB3001-6AA40
	signal lamp assembly, green
1	TAU:913K131306EG
	LED Cluster, base BA 9S L, grün, 110-130V AC/DC
1	TAU:913K131306ER
	LED Cluster, base BA 9S L, red, 110-130V AC/DC
2	3SB3400-1A
	lampholder BA 9S
1	SGO:03503.0-01/13A
	electrical socket SD 035 series
1	KNS:CH10A223-600E+F758
	selector switch 4 pole without off position, 60 degree
2	7PA3032-1AA00-1
	trip supervision relay 110VDC, 2CO
1	7PA2331-1
	fast LOCK-OUT relay 110VDC, 4CO
1	EES:BSM16-54-PRX-00/-Z001
	alarm relay 96x96 mm; 110 V AC/DC; 16 reporting inputs
4	A7E0002934073
	MCU-MH NXPlusC/8DAB/NXPLUS C WKA(LS/TS)/NXPLUS
4	PHO:1700342
	4-pole control spring termination blue
4	PHO:1910982
	4-pole control spring terminal red
4	PHO:1965830
	4-pole control spring termination black
4	PHO:1773604
	5-pole control spring termination grey
1	WIE:90.100.1654.0
	circuit label 140x55mm
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3

Customer: DESCO
Project: DESCO 5 Nos. 132/33kV GIS Substation
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1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
4	label 27x12mm, silver
	3RH2140-1BF40
4	auxiliary relay 110V DC, 4NO
	3RT2916-1DG00
5	surge supressor suppression diode 12-250V DC
	3RH2122-1BF40
5	auxiliary relay 110V DC, 2NO+2NC
	3RT2916-1DG00
4	surge supressor suppression diode 12-250V DC
	3RH2122-1BF40
2	auxiliary relay 110V DC, 2NO+2NC
	3RH2911-1GA31
2	auxiliary switch block, side, 3NO+1NC
	3RT2916-1DG00
1	surge supressor suppression diode 12-250V DC
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
1	label 27x12mm, silver
	953-0041.3
4	label 27x12mm, silver
	3RV1611-1DG14
4	circuit breaker for voltage transformer 3-pole 3A
	3RV1901-1A
	auxil. switch 1NO+1NC

Customer: DESCO
Project: DESCO 5 Nos. 132/33kV GIS Substation
Reference: 3313176045

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- 5 3SB3201-0AA41
pushbutton green 22mm, 1NO+1NC, complete
- 5 3SB3400-0D
actuator with 2NO
- 5 3SB3922-0AV
accessories for inscription plate 12,5x27mm
- 5 3SB3201-0AA21
pushbutton red 22mm, 1NO+1NC, complete
- 5 3SB3400-0D
actuator with 2NO
- 5 3SB3922-0AV
accessories for inscription plate 12,5x27mm
- 1 7SJ85-P1J259837
overcurrent protection relay 7SJ85
- 1 3RH2122-1AP00
auxiliary relay 230V AC, 2NO+2NC
- 3 3RH2911-1GA22
auxiliary switch block, side, 2NC+2NO
- 1 3RT2916-1BD00
varistor 150-250VDC, 127-240VAC

Customer: DESCO
 Project: DESCO 5 Nos. 132/33kV GIS Substation
 Reference: 3313176045

Offer 8DB10
 8DAB-45906

Item No.	Quantity	Description	Typical No.
5.6	3	Circuit-breaker panel 1250 A Maximum permissible feeder current at 40 °C: 1350 A	=HZ04
5.6.1		Busbar system Single-pole insulated busbars for double-busbar system	
5.6.2		Panel construction	
5.6.2.1	1	Three-position disconnecter (System 1) Switching position ON-OFF-EARTHED, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO Free auxiliary contacts earthing switch: 4NO + 4NC + 2CO Two-position disconnecter (System 2) Switching position ON-OFF, installation in a separate compartment, mechanism outside the gas compartment With motor operating mechanism Auxiliary voltage of motor operating mechanism: AC 230 V With electromagnetic interlocking at the disconnecter and earthing switch Auxiliary voltage of electromagnetic interlock: DC 110 V Free auxiliary contacts disconnecter switch: 4NO + 4NC + 2CO with Locking device at the disconnecter and earthing switch (separate function)	
5.6.2.2	1	Vacuum circuit-breaker Vacuum interrupter inside the switching pole compartment, motor operating stored-energy mechanism installed at panel front. Rated voltage: 36.0 kV Rated short-time withstand current: 40 kA Rated current: 1250 A With motor operating stored-energy mechanism Rated operating sequence O - 0,3 s - CO - 3 min - CO with 2 shunt releases Auxiliary voltage of motor-drive AC 230 V Auxiliary voltage of closing solenoid DC 110 V Auxiliary voltage of 1st shunt release DC 110 V Auxiliary voltage of 2 nd shunt release DC 110 V Free contacts of auxiliary switch 7NO + 4NC + 2CO with mechanical switching ON mechanism, padlockable and sealable with mechanical switching OFF mechanism, padlockable and sealable Circuit breaker / Locking device "Feeder earthed" only possible in position "Earthing switch ON"	

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- 5.6.2.3 3 **Current transformers at feeder (B) (B bzw. C1)**
 Current transformer type: 4MC4_90
 Designed as a ring-core current transformer, single-pole, inductive type, climate-independent, secondary connection via terminal strip inside the low-voltage compartment of the panel.
 Arranged outside the primary enclosure.
 Current transformer installation in the panel for Switchgear: 8DADB
 Rated short-time withstand current: 40 kA
 With routine test certificate
 1,2 x rated current
 Maximum core dimension: 190 mm
 1. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 0.2
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 2. Core: 1200 A-600 A / 1 A
 15-7.5 VA / Class: 5P / 15
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
 3. Core: 1200 A-600 A / 1 A
 Class: PX
 Knee Voltage: 700-700 V
 Resistance of secondary winding: 40-40 Ω at 75°C
 Magnetizing current: 40-80 mA at Voltage: 700-700 V
 Connection wires length: 3.8 m
 Used in Phase L1 L2 L3
- 5.6.3 **Panel connection**
- 5.6.3.1 1 **Panel connection at feeder**
 by 2 cable per phase plug size 3
- 5.6.3.2 1 **Capacitive voltage detecting system at the feeder**
 Design:
 LRM system (low-resistance modified) with integrated indicator, with integrated repeat test of the interface, with integrated function test, with integrated signaling relay, type CAPDIS S2+ for the chosen operating voltage
- 5.6.3.3 3 **Surge arrester**
 Surge arrester Connex size 2
 Rated discharge current 10 kA
 Rated voltage Ur 30 kV
 Continuous load voltage Uc 24 kV
 company Pfisterer
- 5.6.4 **Low-voltage compartment**
 Height: 1200 mm

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1	5SY5102-7
	mcb, 1-pole, 2A
1	5ST3010
	auxil.contact 1NO+1NC
1	5SY5101-7
	mcb, 1-pole, 1A
1	5ST3010
	auxil.contact 1NO+1NC
2	5SY5206-7
	mcb, 2-pole, 6A
3	5ST3010
	auxil.contact 1NO+1NC
1	5SY5106-7
	mcb, 1-pole, 6A
1	RZH:TH-H
	thermostat 10A/250V AC, 1 NC
1	RZH:00102020KB0
	switch cabinet heater 20W without thermostat
1	LYQ:LED04-S-E224
	LED-lamp 4W, 230V AC
1	3AX4206
	miniature position switch
4	3SB3201-0AA41
	pushbutton green 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
6	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
4	3SB3201-0AA21
	pushbutton red 22mm, 1NO+1NC, complete
4	3SB3400-0D
	actuator with 2NO
4	3SB3922-0AV
	accessories for inscription plate 12,5x27mm
1	3SB3001-6AA20
	signal lamp assembly, red
1	3SB3001-6AA40
	signal lamp assembly, green
1	TAU:913K131306EG
	LED Cluster, base BA 9S L, grün, 110-130V AC/DC
1	TAU:913K131306ER
	LED Cluster, base BA 9S L, red, 110-130V AC/DC
2	3SB3400-1A
	lampholder BA 9S
1	SGO:03503.0-01/13A
	electrical socket SD 035 series
1	7KM2112-0BA00-3AA0
	digital metering system SENTRON PAC3200
2	7PA3032-1AA00-1
	trip supervision relay 110VDC, 2CO
1	7PA2331-1
	fast LOCK-OUT relay 110VDC, 4CO
1	EES:BSM16-54-PRX-00/-Z001
	alarm relay 96x96 mm; 110 V AC/DC; 16 reporting inputs
1	JGT:P3E021-000_3804943

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	CEWE Prometer W100
1	7UT82-P1F33576
	two winding transformer protection 7UT82
1	7SJ85-P1J216665
	overcurrent protection relay 7SJ85
1	KNS:CH10A223-600E+F758
	selector switch 4 pole without off position, 60 degree
2	A7E0002934073
	MCU-MH NXPlusC/8DAB/NXPLUS C WKA(LS/TS)/NXPLUS
2	PHO:1700342
	4-pole control spring termination blue
2	PHO:1910982
	4-pole control spring terminal red
2	PHO:1965830
	4-pole control spring termination black
2	PHO:1773604
	5-pole control spring termination grey
1	JGT:A11
	Panel mounting kit for counter Cewe Prometer-100
1	WIE:90.100.1654.0
	circuit label 140x55mm
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
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	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
1	953-0041.3
	label 27x12mm, silver
5	3RH2140-1BF40
	auxiliary relay 110V DC, 4NO
6	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
5	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
6	3RT2916-1DG00
	surge supressor suppression diode 12-250V DC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC
4	3RH2122-1BF40
	auxiliary relay 110V DC, 2NO+2NC
2	3RH2911-1GA31
	auxiliary switch block, side, 3NO+1NC

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|---|--|
| 2 | 3RT2916-1DG00 |
| | surge supressor suppression diode 12-250V DC |
| 2 | 3RH2140-1BF40 |
| | auxiliary relay 110V DC, 4NO |
| 2 | 3RT2916-1DG00 |
| | surge supressor suppression diode 12-250V DC |
| 1 | 3RH2122-1AP00 |
| | auxiliary relay 230V AC, 2NO+2NC |
| 3 | 3RH2911-1GA22 |
| | auxiliary switch block, side, 2NC+2NO |
| 1 | 3RT2916-1BD00 |
| | varistor 150-250VDC, 127-240VAC |
| 7 | 3RH2122-1BF40 |
| | auxiliary relay 110V DC, 2NO+2NC |
| 6 | 3RH2122-1BF40 |
| | auxiliary relay 110V DC, 2NO+2NC |
| 6 | 3RH2122-1BF40 |
| | auxiliary relay 110V DC, 2NO+2NC |
| 2 | 3RH2122-1BF40 |
| | auxiliary relay 110V DC, 2NO+2NC |
| 7 | 3RH2911-1GA22 |
| | auxiliary switch block, side, 2NC+2NO |
| 6 | 3RH2911-1GA22 |
| | auxiliary switch block, side, 2NC+2NO |
| 6 | 3RH2911-1GA22 |
| | auxiliary switch block, side, 2NC+2NO |
| 2 | 3RH2911-1GA22 |
| | auxiliary switch block, side, 2NC+2NO |
| 7 | 3RT2916-1DG00 |
| | surge supressor suppression diode 12-250V DC |
| 6 | 3RT2916-1DG00 |
| | surge supressor suppression diode 12-250V DC |
| 6 | 3RT2916-1DG00 |
| | surge supressor suppression diode 12-250V DC |
| 2 | 3RT2916-1DG00 |
| | surge supressor suppression diode 12-250V DC |

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Item No.	Quantity	Description	Typical No. =HZ00
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Switchgear accessories comprising:

3	Acceptance test (in days)
2	End walls
4	Gas pressure indication for busbar system
3	Gas pressure indication with auxiliary contacts 2NO
3	Gas pressure indication with auxiliary contacts 2NO
1	Operation and installation manual 8DB10 Design 2012 in english
3	Factory acceptance test (visual inspection, electrical function test)
1	HV/PD test during FAT
1	Configuration kit for Cewe Prometer-100
45	Voltage detector for LRM-system
1	Handle for disconnecter operation
1	Handle for earthing operation
1	1 hand-crank for charging circuit-breaker drive
1	Socket spanner for low voltage door
1	Adapter emergency operation of three-position-switch